

## Association for Information Systems AIS Electronic Library (AISeL)

---

SIGHCI 2005 Proceedings

Special Interest Group on Human-Computer  
Interaction

---

2005

# The Cultural Implications of Nomadic Computing in Organizations

Lei-da Chen

*Creighton University*, [lchen@creighton.edu](mailto:lchen@creighton.edu)

Cynthia L. Corritore

*Creighton University*, [cindy@creighton.edu](mailto:cindy@creighton.edu)

Follow this and additional works at: <http://aisel.aisnet.org/sighci2005>

---

### Recommended Citation

Chen, Lei-da and Corritore, Cynthia L., "The Cultural Implications of Nomadic Computing in Organizations" (2005). *SIGHCI 2005 Proceedings*. 13.

<http://aisel.aisnet.org/sighci2005/13>

This material is brought to you by the Special Interest Group on Human-Computer Interaction at AIS Electronic Library (AISeL). It has been accepted for inclusion in SIGHCI 2005 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Shaping Consumer Perception to Motivate Online Shopping: A Prospect Theory Perspective

**Daniel Chen**

Texas Christian University  
d.chen@tcu.edu

**Huigang Liang**

Florida Atlantic University  
hliang@fau.edu

## ABSTRACT

Drawing upon prospect theory, we propose that the framings of a message describing the benefits of online shopping will have different impacts on consumers' attitude toward and intention of online shopping. Particularly, a negatively framed message emphasizing the costs of losing the benefits is likely to be interpreted by an individual as loss and a positively framed message emphasizing the benefits of online shopping is likely to be interpreted as gain. According to prospect theory, the negatively framed message is more likely to increase one's intention to shop online than the positively framed message. We also propose that such framing effect is moderated by purchase involvement. This research-in-progress paper presents the rationale behind these propositions, experimental designs to test these propositions, and the expected contributions. We contend that the findings will enhance our understanding about consumers' online shopping and provide prescriptive knowledge regarding how to change their behavior.

## Keywords

Prospect theory, online shopping, message framing, loss aversion.

## INTRODUCTION

Despite the advantages of e-commerce, the uncertainties in the online environment make many consumers reluctant to shop online (Liang et al., 2005, Gefen et al., 2003, Pavlou et al., 2007), suggesting that the negative aspects of online shopping can have a greater impact on consumer behavior than the positive aspects. Similar observations also emerge from general consumer behavior research literature. For example, Mittal, Ross and Baldasare (1998) report that a product's negative performance on an attribute influences consumers' repurchase intention more strongly than the product's positive performance on the same attribute. It seems that consumers respond asymmetrically to negative and positive information and consequently exhibit different behaviors.

This observation instigates an interesting question: Can we direct individuals' perception of online shopping in a way that the benefits of such behavior become more salient and consequently the intention to shop online is

enhanced? The answer to this question is highly relevant to e-tailers as it might suggest some tactics to motivate online shopping behavior despite online risks. Before answering this question, it is important to understand several other issues. For example, how do people make choice under risk? Why do people respond to positive and negative messages differently? And, what are the impacts of positive and negative information framing on behavioral intentions?

When individuals make decisions under risk (e.g., to shop online or not), they usually are not rational due to the complexity around them (Gefen et al., 2003). This irrationality, or, using Herbert Simon's classic term, bounded rationality, does not quite fit into the requirements of applying the widely cited theory of reasoned action (Fishbein and Ajzen, 1975), or its derivatives such as technology acceptance model (Davis et al., 1989, Davis, 1989) and theory of planned behavior (Ajzen, 1991). Therefore, we suggest that another theoretical basis is needed to shed additional light on how humans make behavioral choices under risk.

One theory that helps answering the questions raised above is prospect theory, developed by Daniel Kahneman and Amos Tversky (Tversky and Kahneman, 1986, Tversky and Kahneman, 1981, Kahneman and Tversky, 1979). A primary finding of their work is that people's risky choices are quite different when gains and losses are concerned. People are inclined to be risk-averse in gain-oriented situations and risk-taking in loss-oriented situations, because loss in general looms much larger in human's mind.

In addition, Tversky and Kahneman find that people when offered a choice formulated in one way display risk-aversion but when offered essentially the same choice formulated in a different way display risk-seeking behavior. This is because a choice framed in a positive term (if I accept A, I will get B) is more likely to be interpreted as a gain situation, while the same choice framed in a negative term (if I do not accept A, I will not get B) is more likely to be interpreted as a loss situation. This is called framing effect.

Though prospect theory has been widely employed to explain people's economics behavior and health behavior (Chaiken, 1980, Maheswaran and Meyers-Levy, 1990,

Meyerowitz and Chaiken, 1987, Rothman et al., 1993, Rothman and Salovey, 1997), to our knowledge, its application in the eCommerce context is scant. Given the coexisting benefits and uncertainties of online shopping, we argue that prospect theory is an appropriate theoretical lens through which online shopping behavior can be better understood. Applying the loss aversion logic to online shopping, we propose that whether or not the benefits of online shopping will dominate consumers' perception depends on the framing of messages that describes such benefits. Based on the persuasion literature (Petty and Cacioppo, 1986, Chaiken, 1980), we also propose that the framing effect is moderated by consumers' involvement with the product.

## WHAT IS PROSPECT THEORY

### Challenging Rational Choice Models

Before prospect theory, the dominant theory in decision making was expected utility theory, which assumes people make rational choices under risk (Keeney and Raiffa, 1976). Expected utility theory preaches two principles: utility maximization and choice invariance. The former suggests that people seek choice to maximize their ultimate utilities, and the latter postulates that preference between choices is independent of different representations of the same choice. Tversky and Kahneman (1981) argue that these two principles are often violated because of the imperfection of human perceptions. They conducted the following experiment to demonstrate how these principles are violated in reality.

Participants were asked to choose between two programs to combat an imaginary epidemic that was expected to affect a village with 600 residents. While both programs provided the same expected value (utility), one program offered an uncertain outcome whereas the other offered a certain outcome. Two scenarios were conveyed to the participants, in which messages are framed differently. In the gain-framed scenario, the two programs were described in terms of number of lives to be saved (e.g., if Program A is adopted, 200 people will be saved; if Program B is adopted, there is a 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved). In the loss-framed scenario, the two interventions were presented in terms of the number of mortalities (e.g., If Program A is adopted 400 people will die; if Program B is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.) Though the same two programs were presented in each scenario, the framing changed the way they were perceived by the participants. When considering the programs in terms of life savings, most participants (72 percent) selected Program A, a seemingly certain gain. When considering the interventions in terms of life losses, most participants (78%) were in favor of Program B, a seemingly risky outcome.

According to the utility maximization and choice invariance principles, Programs A and B should have equal chances of being chosen, no matter in which scenario, because they provide the same expected utility. This experiment shows that these principles fail to predict human choice behavior. Indeed, it is the decision frame, which refers to the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice (Tversky and Kahneman, 1981, Kahneman and Tversky, 1979), that influences the preference in decision making. Why do people's choices depend on how the messages are framed? Why does the loss-framed message lead to risk-seeking whereas the gain-framed one invokes risk-aversion?

### The Value Function

Different from expected utility theory positing that the carriers of value are the final states of assets, prospect theory asserts that it is the change in assets that carries value (Kahneman and Tversky, 1979, Tversky and Kahneman, 1986). Asset changes can be described as positive or negative deviations (gains or losses) from a neutral reference point, which is assigned a value of zero. A shift of the reference point can change the value differences between outcomes and thereby influence the preference order between options.

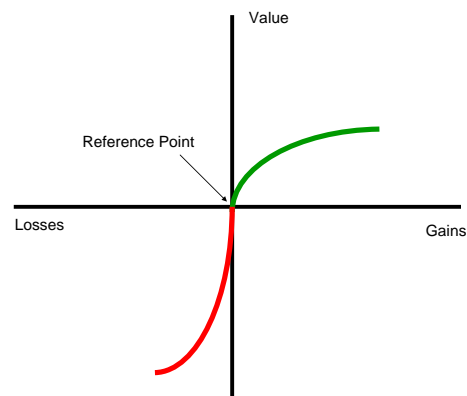


Figure 1. Prospect Theory Diagram

Stated differently, an individual's subjective value of a choice is a function of two arguments: the asset position that serves as reference point; and the magnitude of the change (gain or loss) from that reference point. Tversky and Kahneman (1979) find that the value function can be portrayed as an S-shaped curve (Figure 1), which is concave for gains and convex for losses. The curve is steeper for losses than for gains. That is, given the same absolute magnitude of changes in loss and gain, the value change corresponding to the loss change is larger than that corresponding to the gain change.

### The Choice Process

---

In prospect theory, the term prospect is used to refer to an option that could yield one or more possible outcomes. Decision making is essentially a choice between prospects. A choice process consists of two phases: editing and evaluation. In the editing phase, an individual preliminarily analyzes the prospects by transforming and reorganizing the outcomes and probabilities associated with the prospects so that a simple representation of these prospects can be achieved to facilitate the subsequent evaluation phase (Kahneman and Tversky 1979). It is found that people simplify the outcomes of each prospect as gains or losses based on a neutral reference point and the formulation of the prospect. This suggests that prospects may be formulated in different ways to influence people's choices, i.e., the framing effect.

In the evaluation phase, people evaluate each of the edited prospects, and choose the prospect of the greatest value. Prospect theory emphasizes that the value of an uncertain outcome (positive or negative variation from the reference point) is not weighted by its probability ( $p$ ), but a decision weight  $\pi(p)$ , a monotonic function of  $p$ . The weighting function of  $\pi$  is nonlinear. The low probabilities are overweighed compared to the moderate and high probabilities. This unique nature of  $\pi$  helps people choose between prospects by detecting that one dominates another or by comparing their values.

#### **PROSPECT THEORY AND ONLINE SHOPPING**

Prior e-commerce studies have greatly improved our understanding of online shopping behavior by identifying positive (usefulness, ease of use, convenience, price advantage, joyfulness) and negative (product risk, vendor uncertainty, privacy and security uncertainty etc.) factors affecting online shopping. However, those studies are consistent with expected utility theory, assuming that people make rational choices and there is choice invariance toward online shopping behavior. Hence, they largely neglect the fact that there are two phases in consumers' choice processes and different framing might influence their attitudes toward the same choice.

While we follow the social psychological scholars by admitting online shopping is a consciously intended behavior, in this paper we emphasize that such intention results from the choice process of consumers. Drawing on prospect theory, we attempt to examine how message framing affects online shopping and how issue involvement moderates the effect of message framing.

#### **Framing Effects on Online Shopping Intention**

Prospect theory suggests that individuals are sensitive to the framing of a behavioral alternative (gain or loss) even when the same information is conveyed. There is a mapping between external message framing and human perceptions in the choice process: whether an alternative is coded by an individual as a gain or loss depends on

how the information about the alternative is framed (Tversky and Kahneman, 1981). A negatively framed message is likely to be interpreted as loss; whereas a positively framed message is likely to be perceived as gain (Meyerowitz and Chaiken, 1987). As described earlier, loss is predicted to associate with risk taking behavior as it looms larger than gain. Therefore, it suggests that people are more likely to take risky option when receiving a negatively framed message.

Message framing has been applied to stimulate individual health behavior (Rothman and Salovey, 1997). We argue that it can be applied to motivate online shopping behavior as well. In particular, different consequences may result when a message regarding the benefits of online shopping is presented in different manners. A positively framed message (e.g., if you shop online, you will enjoy the opportunity to save money) is gain-oriented, whereas a negatively framed message (e.g., if you do not shop online, you will lose the opportunity to save money) is loss oriented. Because of the loss aversion tendency, the negatively framed message that emphasizes the cost of not taking an act will be more effective in motivating online shopping behavior. Therefore,

*P1: Compared to positively framed messages, negatively framed messages about the benefits of online shopping are more likely to positively affect attitude toward online shopping and intention to shop online.*

#### **The Moderating Role of Issue Involvement**

Previous persuasion literature (Petty and Cacioppo, 1986, Chaiken, 1980) suggests that a message can be processed in two modes: systematically (attention to the details of the message) or heuristically (attention to surface features of the message). The ultimate influence of a framed message depends on whether or not this message is processed systematically. The systematic processing is a necessary precondition to observe the impact of framing (Rothman and Salovey, 1997).

Research shows that individuals who are highly involved with an issue pay more attention to the details of the relevant messages that they receive (Petty and Cacioppo, 1986, Chaiken, 1980) and they are more likely to integrate these information in a systematic way (Petty and Cacioppo, 1986). In contrast, people who are trivially involved in an issue are predicted to process information heuristically. Therefore, if the influence of a framed message relies on it being systematically processed, the expected pattern of framing effects should be obtained when people are involved with that issue (Rothman and Salovey, 1997).

The moderating role of issues involvement on message framing has been reported in health behavior literature (Rothman et al., 1993, Maheswaran and Meyers-Levy, 1990). In the context of online shopping, Pavlou et al

(2007) demonstrated that the consumers' perceived uncertainty of purchasing a high involvement product (e.g., medicine) is higher than that of a low involvement product (e.g., book). Because uncertainty increases the information processing needs (Galbraith, 1974), it follows that people tend to process information more systematically when they consider purchasing high involvement products online.

Previous literature also shows that under a high involvement condition, negative information receives greater weight when processed systematically (loss aversion) and therefore has a greater influence than positive information (Wright, 1981, Kanouse, 1984). Conversely, under a low involvement condition, positive information is more influential than negative information. This is because when processed heuristically, the positive information is more likely to elicit an affective response such as a pleasant mood (Rothman and Salovey, 1997). Applied in the online shopping context, the following proposition is developed:

*P2: Under a high involvement condition, negatively framed messages about the benefits of online shopping have a stronger effect on positive online shopping attitude and intention than positively framed messages. Under a low involvement condition, positively framed messages about the benefits of online shopping have a stronger effect on positive online shopping attitude and intention than negatively framed messages.*

## METHODOLOGY

We will recruit 200 consumers through local newspapers to participate in a controlled experiment. The experimental design is 2 by 2 (message framing by involvement). Involvement is manipulated by the product to be purchased – TV (high involvement) vs. book (low involvement). The participants will be randomly assigned into four groups: (1) positive framing + book, (2) negative framing + book, (3) positive framing + TV, and (4) negative framing + TV, with 50 in each group.

At the experiment all of the participants will be provided with a scenario – “Suppose that you plan to buy a big-screen plasma TV (or book). You can buy one from a local store or from a website.” Based on this scenario, the positively framed message will be – “If you buy a TV/book from the Internet, you can get a 15% off discount.” The negative-framing group will get a negatively framed message – “If you don't buy a TV/book from the Internet, you will lose the opportunity to get a 15% off discount.”

The dependent variables (participants' attitude and intention) and some control variables (trust disposition, online shopping experience, privacy concerns, and perceived risk) will be measured by using a questionnaire. Two product involvement questions will be used to assess

the participants' perceptions of importance and relevance of the products to be purchased.

We will obtain measurement scales of the dependent and control variables from the IS literature. Specifically, the scales for attitude and intention will be derived from Davis et al (1989); the trust disposition scale will be obtained from McKnight et al (2002); the privacy concern scale will be elicited from Smith et al (1996); and perceived risk is measured by following Pavlou (2003). Online shopping experience is assessed by years of online shopping, the total number of items bought online, and the total monetary value of online purchases.

Two-way ANOVA will be used for data analysis. The main effects of message framing and purchase involvement as well as the interaction effect between the two will be examined. We expect that the negatively framed message is more effective in influencing attitudes and online purchase intentions of TV purchasing, while the positively framed message is more effective in influencing attitudes and intentions of book purchasing.

## DISCUSSION

This study makes several contributions to e-commerce research. First, we apply prospect theory to explain consumers' online shopping behavior. Prospect theory differs from other decision models “in being unabashedly descriptive and in making no normative claims” (Tversky and Kahneman 1986, p. 227). Therefore it can be used to explain preferences, whether or not they can be rationalized. Compared with the extant e-commerce literature that views consumers as totally rational, this study provides a more realistic account of online shopping behavior.

Second, this study highlights consumers' tendency towards loss aversion. It suggests that consumers are more likely to shop online when not shopping online is perceived as a loss. It further explicates that purchase involvement plays a moderating role in complicating the framing effects. Most previous e-commerce studies implicitly assume that positive and negative attributes of e-commerce are equally important. This study suggests that the negative attributes may be outweighed by consumers and the degree of outweighing depends on the importance of the product to be purchased. Thus, this study compliments previous research by offering an in-depth understanding of consumers' intuitive judgments and choices.

Finally, this study is prescriptive. That is, it is intended to generate knowledge regarding what can be done to change consumers' online shopping behavior. In contrast, the majority of existing e-commerce studies is descriptive in nature. While they help to understand the antecedents of behavior, they do not directly explain how to change

behavior. Therefore, our study is likely to make a contribution to the e-commerce literature.

## REFERENCES

1. Ajzen, I. (1991) The Theory of Planned Behavior, *Organizational Behavior and Human Decision Processes*, 50, 179-211.
2. Chaiken, S. (1980) Heuristic versus systematic information processing and the use of source versus message cues in persuasion, *Journal of Personality and Social Psychology*, 39, 752-756.
3. Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, 13, 3, 319-340.
4. Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989) User Acceptance of Computer Technology: A Comparison of Two Technological Model, *Management Science*, 35, 8, 982-1003.
5. Fishbein, M. and Ajzen, I. (1975) *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading.
6. Galbraith, J. R. (1974) Organization design: An information processing view, 4, pp. 28-36.
7. Gefen, D., Karahanna, E. and Straub, D. W. (2003) Trust and Tam in Online Shopping: An Integrated Model, *MIS Quarterly*, 27, 1, 51-90.
8. Kahneman, D. and Tversky, A. (1979) Prospect Theory: An Analysis of Decision Under Risk, *Econometrica*, 47, 2, 263-291.
9. Kanouse, D. E. (1984) Explaining negativity biases in evaluation and choice behavior, In *Advances in consumer research* (Ed, Kinnear, T. C.) Associates for Consumer Research, Provo, UT.
10. Keeney, R. L. and Raiffa, H. (1976) *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*, Wiley, New York.
11. Liang, H., Xue, Y., Laoethakul, K. and Lloyd, S. J. (2005) Information systems and health care: trust, uncertainty, and online prescription filling, *Communications of AIS*, 15, 41-60.
12. Maheswaran, D. and Meyers-Levy, J. (1990) The Influence of Message Framing and Issue Involvement, *Journal of Marketing Research*, 27, 361-367.
13. Meyerowitz, B. E. and Chaiken, S. (1987) The Effect of Message Framing on Breast Self-Examination Attitudes, Intentions, and Behavior, *Journal of Personality and Social Psychology*, 52, 3, 500-510.
14. Mittal, V., Ross, W. T. and Baldasare, P. M. (1998) The Asymmetric Impact of Negative and Positive Attribute-Level Performance on Overall Satisfaction and Repurchase Intention, *Journal of Marketing*, 62, 33-47.
15. Pavlou, P. A., Liang, H. and Xue, Y. (2007) Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principle-Agent Perspective, *MIS Quarterly*, 31, Forthcoming.
16. Petty, R. E. and Cacioppo, J. T. (1986) The elaboration likelihood model of persuasion, In *Advances in experimental social psychology*, Vol. 19 (Ed, Berkowitz, L.) Academic Press, pp. 123-205.
17. Rothman, A. J. and Salovey, P. (1997) Shaping Perceptions to Motivate Healthy Behavior: The Role of Message Framing, *Psychological Bulletin*, 121, 1, 3-19.
18. Rothman, A. J., Salovey, P., Antone, C., Keough, K. and Martin, C. D. (1993) The Influence of Message Framing on Intentions to Perform Health Behaviors, *Journal of Experimental Social Psychology*, 29, 408-433.
19. Smith, H., Milberg, S. and Burke, S. (1996) Information privacy: measuring individuals' concerns about organizational practices, *MIS Quarterly*, 20, 2, 167-196.
20. Tversky, A. and Kahneman, D. (1981) The Framing of Decisions and the Psychology of Choice, *Science*, 211, 30, 453-458.
21. Tversky, A. and Kahneman, D. (1986) Rational Choice and the Framing of Decisions, *Journal of Business*, 59, 4, 251-278.
22. Wright, P. (1981) Cognitive responses to mass media advocacy, In *Cognitive responses in persuasion* (Eds, Petty, R. E., T.M.Ostrom and T.C.Brook) Erlbaum, Hillsdale, NJ.